

WHAT IS CLAIMED IS:

1. A fixing device of an image forming apparatus comprising a heat roller and a pressure roller, the heat roller comprising:
 - a roller support frame fixedly installed within the heat roller;
 - a film tube supported by the roller support frame; and
 - a heat transfer unit transferring radiation energy toward a part of the film tube that is in contact with the pressure roller.
2. The fixing device according to claim 1, wherein the film tube rotates in a linear speed which is same as that of the pressure roller.
3. The fixing device according to claim 1, wherein the heat transfer unit is fixedly installed in the roller support frame.
4. The fixing device according to claim 1, wherein the heat transfer unit comprises:
 - a halogen lamp generating light energy,
 - a light-to-heat converting unit converting the light energy emitted from the halogen lamp into heat energy, and
 - a radiation energy converging unit converging the light energy emitted from the halogen lamp onto the light-to-heat converting unit.
5. The fixing device according to claim 4, wherein the radiation energy converging unit comprises:
 - a quartz glass plate transmitting the light energy emitted from the halogen lamp, and
 - a reflector reflecting the light energy emitted from the halogen lamp towards the quartz glass plate.
6. The fixing device according to claim 5, wherein the reflector is installed above the quartz glass plate to enclose the halogen lamp.
7. The fixing device according to claim 4, further comprising:
 - a thermal grease applied on an external surface of the light-to-heat converting unit.

8. The fixing device according to claim 4, wherein glass is coated on an external surface of the light-to-heat converting unit.
9. The fixing device according to claim 4, wherein the light-to-heat converting unit is a black body having an absorption property corresponding to the emitted light energy.
10. The fixing device according to claim 5, wherein the thickness of the quartz glass plate is not greater than 5 mm.
11. An image forming apparatus to form a toner image on an image forming medium, comprising:
a heat roller;
a pressure roller, wherein a paper passes between the heat roller and the pressure roller; and
a fixing device focusing heat on a position where the heat roller and the pressure roller engage with each other to fix a toner image onto the image forming medium.
12. The image forming apparatus of claim 11, wherein the heat roller comprises:
a film tube forming an outermost layer of the heat roller and rotating in a linear speed same as that of the heat roller,
a roller support frame supporting the film tube, and
a heat transfer unit.
13. The image forming apparatus of claim 12, the film tube is formed of polyimide and is coated with PFA or PTFE on a surface thereof.
14. The image forming apparatus of claim 12, wherein the roller support frame is secured with the heat roller together with the heat transfer unit.
15. The image forming apparatus of claim 12, wherein only the film tube is engaged and rotated with the pressure roller.
16. The image forming apparatus of claim 12, wherein the heat transfer unit comprises:

a halogen lamp emitting radiation energy, and
a black body converting the radiation energy into heat energy.

17. The image forming apparatus of claim 16, wherein the black body is a light-to-heat converting element comprising a glass coating or a thermal grease on an external surface thereof.

18. The image forming apparatus of claim 16, further comprising:
a radiation energy converging unit comprising
a reflector having a top and both sides of the halogen lamp and spaced from the halogen lamp, and
a quartz glass plate installed below the halogen lamp and spaced from the halogen lamp and in contact with a top of the black body.

19. The image forming apparatus of claim 18, wherein the reflector comprises an inverted U-shape and reflects the radiation energy emitted from the halogen lamp to an underside of the halogen lamp.

20. The image forming apparatus of claim 18, wherein the quartz glass plate comprises a thickness not greater than 5 mm so that the light-to-heat converting element is heated to a fixing temperature within a short length of time.

21. The image forming apparatus of claim 11, wherein the image forming medium comprises a paper.

22. The image forming apparatus of claim 18, wherein the radiation energy emitted by the halogen lamp is reflected by the reflector and converged onto the quartz glass plate, where the reflector is positioned below the quartz glass plate.

23. The image forming apparatus of claim 22, wherein the quartz glass plate comprises good light transmittance and most of the radiation energy is transferred to the black body, which is in contact with a lower surface of the quartz glass plate, and the transferred radiation energy is converted into heat energy while being absorbed by the black body.

24. The image forming apparatus of claim 23, wherein the quartz glass plate has a heat conductivity where most of the heat energy converted by the black body is used to increase a temperature of the pressure roller to fix the toner image onto the image forming medium.

25. The image forming apparatus of claim 24, wherein the film tube is supported by the roller support frame and is rotated while engaged with the pressure roller with a predetermined pressure.

26. The image forming apparatus of claim 25, wherein the film tube receives the heat from the black body and transfers the heat to the image forming medium.